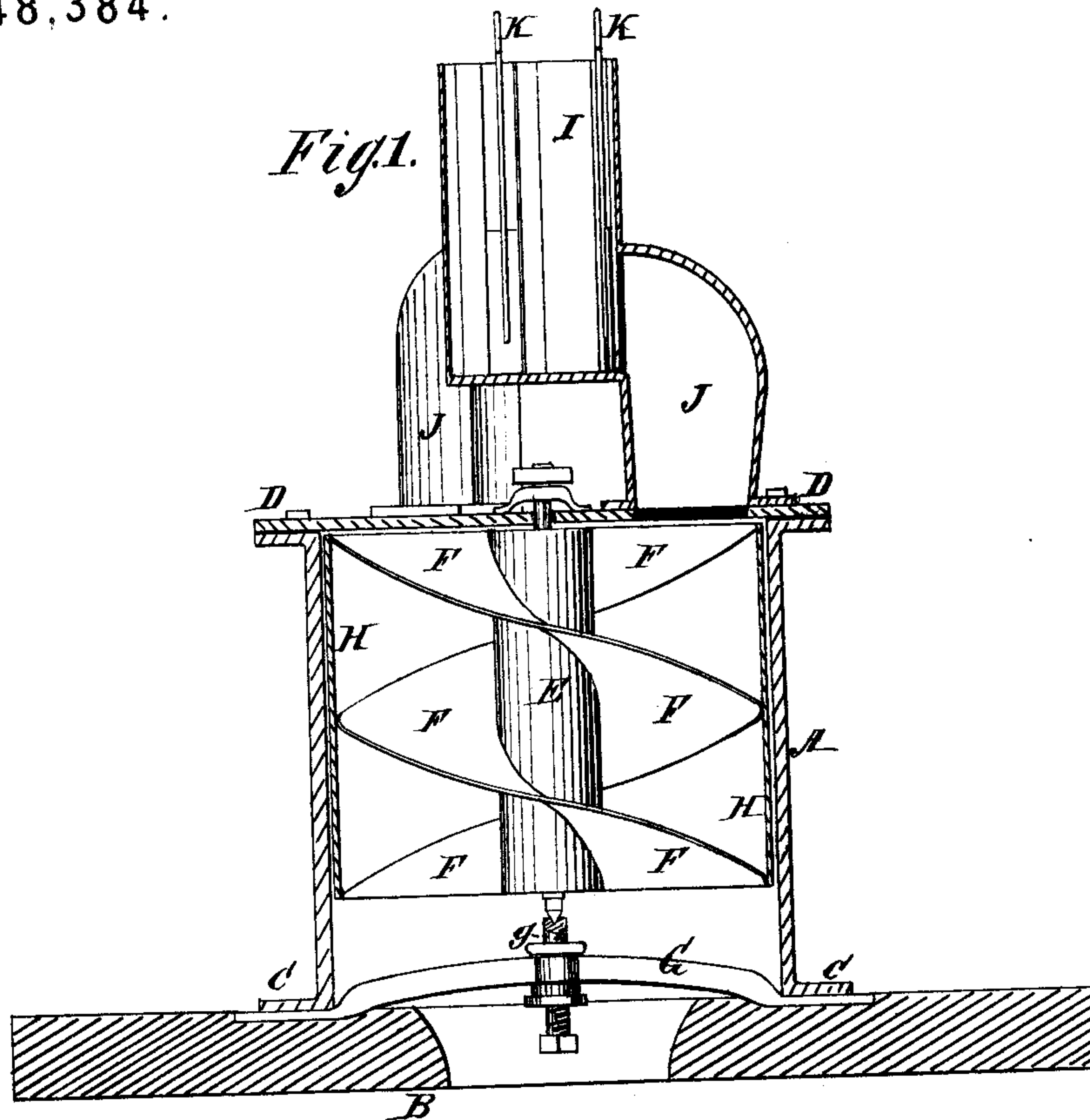


**C. REDFIELD.**  
**Water-Wheels.**

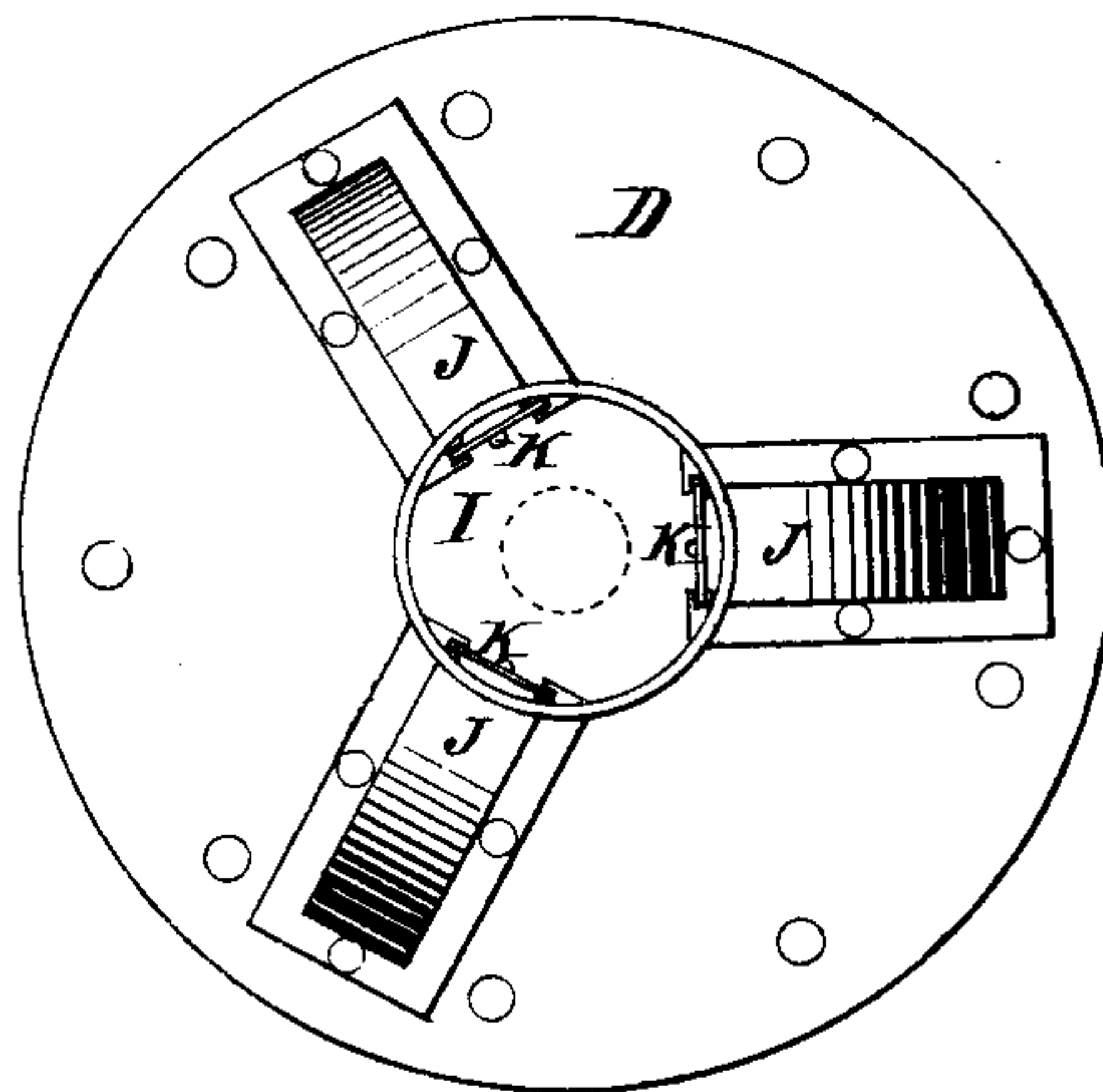
Patented March 10, 1874.

No. 148,384.

*Fig. 1.*



*Fig. 2.*



Witnesses.  
*G. Watkins*  
*John C. Kemow*

Inventor.  
*Chas. Redfield*  
 Per *Wm. T. B.*  
 Attorneys.

# UNITED STATES PATENT OFFICE.

CHARLES REDFIELD, OF NEW YORK, N. Y.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 148,384, dated March 10, 1874; application filed February 7, 1874.

*To all whom it may concern:*

Be it known that I, CHARLES REDFIELD, of the city, county, and State of New York, have invented a new and Improved Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a vertical sectional elevation; and Fig. 2, a plan view.

The invention relates to, and consists in, means whereby (in spirally-flanged water-wheels) there may be used a greater head of water than is practicable under ordinary circumstances, and whereby a greater force may be thus applied than is usually possible.

A represents the cylindrical case; B, the open bed-piece; C, a flange by which they are connected and attached together; and D, the cover. E is the water-wheel shaft, on which are located the two spiral blades or buckets F F, carried in opposite directions around it. G is the bridge-tree, whose adjustable pivot-pin *g* receives the socketed end of shaft, and allows the latter to turn freely thereon. H is a rotary cylinder, to which are rigidly attached the buckets F F, so that the buckets, the shaft, and this cylinder may revolve together. This greatly relieves the retarding friction of the water, that usually strikes the stationary cylinder in which the buckets move, and augments the velocity or power which is usually generated by a given current of water. I is the pen-stock, and J branches, the latter capable altogether of discharging the maximum of water that can come through the former. K is a series of adjustable gates that slide vertically in front of the branches J, and graduate the supply of water passed through them. As the friction of the running water

over the spiral buckets causes the wheel to turn, and as a stream beyond a certain volume only causes the wheel to carry a greater weight, and tends to clog its movement, it becomes an important question how to apply a given volume of water so as to produce the greatest amount of friction upon the spiral buckets as it runs through the wheel. I first provide for a greater surface contact between water and buckets, by making two spiral buckets, which not only co-operate in turning the wheel, but, by maintaining a corresponding weight of water on each side of wheel, enable it to run more steadily, and with less counter-acting friction.

By using two or more branches to the pen-stock, the stream, that, poured in a body upon one spiral flange would only obstruct and have less effect than a moiety thereof, is made fully to double the actuating power by being divided into two parts, and poured separately upon the different spiral buckets. By means of the independent gates, the water may be always equally divided, no matter what may be the volume passing through the pen-stock, or in case of a very diminished supply (only sufficient properly to operate one bucket) all the gates but one may be closed.

Having thus described my invention, what I claim is—

The combination, with cylindrical case A D and superposed pen-stock I J, provided with adjustable gates, of the vertical shaft E, spiral flanges F F, and cylinder H, all made fast and rotating together, as and for the purpose specified.

CHAS. REDFIELD.

Witnesses:

A. P. THAYER,  
T. B. MOSHER.